

REMARKS

Claims 7, 18, 20, and 52 have been amended. New claims 56-61 have been added. Claims 1-6, 9-17, 23-51, and 55 were previously canceled. Accordingly, claims 7, 8, 18-22, 52-54, and 56-61 are presently pending in this application. The status of the claims set forth in the Office Action dated November 25, 2005, is as follows:

(A) Claims 7, 18, 20, and 21 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,338,669 ("Togawa"); and

(B) Claims 8, 19, 20, and 22 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,964,413 ("Mok").

A. Response to Section 102 Rejection–Togawa

Independent claims 7 and 18 were rejected under 35 U.S.C. § 102 as being anticipated by Togawa. As described below, the rejection of these claims should be withdrawn because Togawa does not teach or suggest all of the features of these claims.

(1) Claim 7 is Directed Toward a Planarizing Machine With a Movable Fluid Discharge Unit That Can Move Along a Support During a Planarizing Cycle

Amended claim 7 is directed toward a planarizing machine that includes a table having a support surface and a processing pad on the support surface. The planarizing machine further includes a carrier assembly having a head configured to hold a microelectronic workpiece and a drive assembly carrying the head relative to the support surface. The planarizing machine still further includes a solution dispenser separate from the head. The solution dispenser is configured to discharge a planarizing solution onto a plurality of locations on the pad. The solution dispenser includes an elongated support extending over the pad at a location spaced apart from a travel path of the head, a fluid passageway carried by the support through which a planarizing solution can flow, and a fluid discharge unit slidably carried by the support and in fluid communication with the fluid passageway. The fluid discharge unit is moveable along the support to discharge a flow of the planarizing solution onto separate areas of the processing pad during a planarizing cycle.

(2) Togawa Discloses a Polishing Machine With a Nozzle That Can Be Positioned Between Planarization Cycles

The stated object of Togawa is to provide a polishing machine that does not hinder maintenance work such as the exchange of polishing pads and that is capable of positively supplying liquid at an optimum position on a polishing surface of a turntable (col. 1, ll 55-61). Togawa discloses a first polishing machine with a liquid supply arm that is movable by hand between a liquid supply position above a turntable and a retracted position that allows the first polishing machine to be accessed for maintenance (col. 3, ll 14-43). The liquid supply arm includes a nozzle unit attached to an arm body via a slide mechanism (col. 4, ll 13-16; col.6, ll 1-28; Figures 6 and 7). The nozzle unit includes four nozzles and is carried by the liquid supply arm so that when the arm is in the liquid supply position, the four nozzles coincide with the turn axis of the turntable (col. 4, ll 49-55). Centrifugal force causes polishing fluid deposited near the center of the turntable to spread uniformly to the outer edges of the polishing surface (col. 4, ll 55-59). The slide mechanism includes a slide member attached to the nozzle unit and allows the nozzle unit to be removed from the arm body (col. 3, ll 60-62; col. 4, ll 13-16; col.6, ll 1-28; Figures 6 and 7). To remove the nozzle unit from the arm body, an operator removes screws from the slide mechanism and slides the nozzle assembly (with the slide member attached) off the arm body (col. 3, ll 60-62; col. 4, ll 13-16; col.6, ll 1-28; Figures 6 and 7). Togawa does not teach or suggest moving the liquid supply arm or the nozzle while a wafer is being planarized.

Togawa also discloses a second polishing machine with a liquid supply arm that has a fixed nozzle on the forward end of the arm and a movable nozzle slidably coupled to an arm body (col. 7, ll 18-60; Figures 8 and 9). The movable nozzle is held in a desired position by a fixing device (col. 7, ll 18-60; Figures 8 and 9). The movable nozzle is located at a radial position above the polishing surface of a turntable corresponding to a center of a wafer being processed (col. 8, ll 1-12; Figures 8 and 9). The fixed nozzle is positioned at the center of the polishing surface of the turntable (col. 8, ll 1-12; Figures 8 and 9). Togawa does not teach or suggest moving the liquid supply arm or any nozzle while a wafer is being planarized.

(3) Togawa Fails to Teach or Suggest, Among Other Features, a Planarizing Machine With a Fluid Discharge Unit Movable Along a Support During a Planarizing Cycle

Togawa fails to teach or suggest the combination of elements set forth in claim 7. For example, Togawa does not teach or suggest a planarizing machine with a fluid discharge unit movable along a support during a planarizing cycle. As discussed above, Togawa does not disclose or suggest moving the liquid supply arm or any nozzle while a wafer is being planarized. In Togawa, each nozzle is positioned to deposit planarizing fluid at a single discrete location while a wafer is being planarized. The planarizing machine in Togawa relies on centrifugal force to spread the fluid uniformly over the polishing surface. Accordingly, Togawa fails to teach or suggest a fluid discharge unit slidably carried by a support and moveable along the support to discharge a flow of the planarizing solution onto separate areas of the processing pad during a planarizing cycle, as recited in claim 7.

Furthermore, a person skilled in the art would not be motivated to modify Togawa to include a nozzle that moves along the liquid supply arm to discharge a flow of planarizing solution onto separate areas of the processing pad during a planarizing cycle. As discussed above, a purpose of Togawa is to provide a polishing machine that is capable of positively supplying liquid at a single discrete position on a polishing surface of a turntable during a planarizing cycle. Moving the nozzle along the liquid supply arm to discharge a flow of planarizing solution onto separate areas of the processing pad during a planarizing cycle would destroy this purpose.

Therefore, for at least these reasons, claim 7 is patentable over Togawa. New claim 56 depends from claim 7 and, for at least this reason, it is also patentable over Togawa. Amended independent claim 18 includes, *inter alia*, features similar to claim 7. For at least this reason, claim 18 is also in condition for allowance. New claim 58 depends from claim 18 and, for at least this reason, it is also patentable over Togawa.

(4) Claim 20 is Also Patentable Over Togawa Because, Among Other Features, Claim 20 Includes A Nozzle That is Movable During a Planarizing Cycle

Amended claim 20 is directed toward a planarizing machine that includes a table having a support surface and a processing pad on the support surface. The planarizing machine further includes a carrier assembly having a head configured to hold a microelectronic workpiece and a drive assembly carrying the head. The planarizing machine still further includes a solution dispenser having support above the pad and a nozzle moveably coupled to the support so that the nozzle is movable during a planarizing cycle. The nozzle is coupleable to a planarizing solution.

Claim 20 is patentable over Togawa because Togawa fails to teach or suggest the combination of elements set forth in claim 20. As explained above, Togawa does not teach or suggest moving the liquid supply arm or moving any nozzle while a wafer is being planarized. Accordingly, for at least this reason claim 20 is patentable over Togawa. Claims 21, 22, and 60 depend from claim 20 and, for at least this reason, these claims are also patentable over Togawa.

B. Response to Section 102 Rejection–Togawa

Independent claims 8, 19, and 20 were rejected under 35 U.S.C. § 102 as being anticipated by Mok. As described below, the rejection of these claims should be withdrawn because Mok does not teach or suggest all of the features of these claims.

(1) Claim 8 is Directed Toward a Planarizing Machine With a Nozzle Rotatably Coupled to a Support

Amended claim 8 is directed toward a planarizing machine that includes a table having a support surface and a processing pad on the support surface. The planarizing machine further includes a carrier assembly having a head configured to hold a microelectronic workpiece and a drive assembly carrying the head relative to the support surface. The planarizing machine still further includes a solution dispenser separate from the head. The solution dispenser is configured to discharge a planarizing solution onto a plurality of locations on the pad. The solution dispenser comprises a support extending over the pad at a location spaced apart from a travel path of the head, a fluid passageway carried by the support through which a planarizing

solution can flow, and a nozzle carried by the support and in fluid communication with the fluid passageway. The nozzle is rotatably coupled to the support.

(2) Mok Discloses a Spinning Wheel That Sprays Fluid on the Surface of a Polishing Pad

Mok discloses a slurry dispenser that includes a slurry reservoir, a spinning wheel, and a housing (col. 1, ll 53-61). The rotating wheel is driven by a motor and is positioned relative to the reservoir so that the wheel picks up fluid from the reservoir as it rotates (col. 1, ll 53-67). The centrifugal force of the spinning wheel creates a spray of fluid (col.1, l 53 - col. 2, l 4). A portion of the spray of fluid exits the housing through an opening in the housing and onto a polishing pad (col.1, l 53 - col.2, l 4). Mok teaches that a rotating wheel is advantageous compared to nozzles because Mok states that nozzles can become clogged (col. 1, ll 42-49; col. 2, ll 45-50). The slurry dispenser in Mok is accordingly intended to replace nozzles to provide better flow rate control and avoid clogging (col. 1, ll 37-50; col. 2, ll 45-50).

(3) Mok Fails to Teach or Suggest, Among Other Features, a Planarizing Machine With a Nozzle Rotatably Coupled to a Support

Mok fails to teach or suggest the combination of elements set forth in claim 8. For example, Mok does not teach or suggest a planarizing machine with a nozzle rotatably coupled to a support. As discussed above, Mok discloses a rotating wheel to dispense fluid instead of a nozzle because Mok states that nozzles are prone to clogging and asserts that nozzles have poor flow rated control. As disclosed in the present application and supported by both Mok and the common definition of a nozzle, a rotating wheel is physically and functionally different than a nozzle. Accordingly, the rotating wheel in Mok cannot be considered a nozzle rotatably coupled to a support as suggested in the above referenced Office Action. Additionally, even if for the sake of argument the housing were considered to be a nozzle, the housing in Mok is not rotatably coupled to a support or movable relative to the support.

Furthermore, a person skilled in the art would not be motivated to modify Mok to include a rotatable nozzle because the slurry dispenser in Mok is intended to replace the nozzles of the prior art. Accordingly, Mok actually teaches away from using a nozzle to dispense the slurry used to polish a wafer.

Therefore, for at least these reasons, claim 8 is patentable over Mok. Amended independent claim 19 includes, *inter alia*, features similar to claim 8. For at least this reason, claim 19 is also in condition for allowance.


(4) Claim 20 is Also Patentable Over Mok Because Mok Also Fails to Teach or Suggest, Among Other Features, a Planarizing Machine With a Nozzle Moveably Coupled to the Support so That the Nozzle is Movable During a Planarizing Cycle

Claim 20 is also patentable over Mok because this reference fails to teach or suggest the combination of elements set forth in claim 20. For example, Mok does not teach or suggest a nozzle of any type because Mok teaches away from using nozzles to dispense planarizing fluids. Accordingly, for at least this reason claim 20 is patentable over Mok. Claims 21 and 22 depend from claim 20 and, for at least this reason, these claims are also patentable over Mok.

In view of the foregoing, the pending claims comply with 35 U.S.C. § 112 and are patentable over the applied art. The applicant accordingly requests reconsideration of the application and a Notice of Allowance. If the Examiner has any questions or believes a telephone conference would expedite prosecution of this application, the Examiner is encouraged to call the undersigned representative at (206) 359-6477.

Respectfully submitted,
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Date: 24 March 2006



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